

***Remarks***

Reconsideration of this Application is respectfully requested. Upon entry of the foregoing amendment, claims 1-36 are pending in the application, with 1, 13 and 27 being the independent claims. Claims 5, 6, and 9 are cancelled without prejudice to or disclaimer of the subject matter therein. Claim 1 has been amended. Support for the amendment of claim 1 is found throughout the specification and originally filed claims, specifically at claim 9. These changes are believed to introduce no new matter, and their entry is respectfully requested. Based on the above amendment and the following remarks, Applicants respectfully request that the Office reconsider all outstanding objections and rejections and that they be withdrawn.

***Rejection under 35 U.S.C. § 112 ¶ 1***

Claims 1-2, 5-6, 9-10 and 25 have been rejected under 35 U.S.C. § 112, ¶ 1 as allegedly containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had full possession of the claimed invention. (*Office Action*, page 3). Applicants respectfully traverse this rejection.

The Office is of the opinion that:

[t]he specification as originally filed does not provide adequate support for generic claims herein. The specification merely describes glucosamine derivatives (linker group is -NH-). The specification has not exemplified conjugates having any other linker groups (L) which are encompassed within the scope of the claims. The specification merely exemplifies compounds 5, 10, and 14 (pages 45-48) and those compounds shown in Figure 4. Each of these compounds is a glucosamine derivative. . . . In this case, the claimed 2-deoxyglucose conjugates herein are deemed not to adequately describ[e] compounds wherein the linker group L is other than -NH-. Thus, ordinary artisans could not the operability of those compounds. Thus, the claimed 2-deoxyglucose conjugates having L other than -NH- are seen to clearly lack written description.  
(*Office Action*, pages 3-4).

Applicants respectfully disagree. An applicant satisfies the written description requirement when the patent specification describes "the claimed invention in sufficient detail that one skilled in the art can reasonably conclude that the inventor had possession of the claimed invention." *Manual of Patent Examining Procedure*, 8th edition, revision 6, 2100-173 (September 2007)("MPEP"); *see also*, *Moba, B.V. v. Diamond Automation, Inc.*, 325 F.3d 1306, 1319 (Fed. Cir. 2003). Possession may be demonstrated by the "disclosure . . . of structural chemical formulas that show that the invention was complete." MPEP § 2161.01, 2100-172; *see also*, *Lockwood v. American Airlines, Inc.*, 107 F.3d 1565, 1572 (holding that possession may be established by use of "such descriptive means as words, structures, figures, diagrams, formulas, etc., that fully set forth the claimed invention.") Accordingly, the use of chemical formulae in the specification (paragraph [0036], page 4) of the present application provide adequate written description within the meaning of 35 U.S.C. § 112, ¶ 1. In addition, the linker groups listed claim 1 were recited in the originally filed claims. The originally filed claims are part of the original disclosure and, therefore, no further written description support is the specification is needed.

Furthermore, Applicants respectfully disagree that the absence of working examples directed to linker groups other than –NH– indicates that the Applicants did not have possession of or adequate support for such linker groups (L) since the presence or the absence working examples has no bearing on the fulfillment of the written description requirement. The issue regarding use of examples in the specification is traditionally directed to the enablement requirement of 35 U.S.C. § 112, ¶ 1 not the written description requirement of 35 U.S.C. § 112, ¶ 1. *See e.g.* MPEP § 2164.01(b), 2100-195. Therefore, use of chemical formulae in the specification (paragraph [0036],

page 4) of the present application satisfies the written description requirement within the meaning of 35 U.S.C. § 112, ¶ 1. Based on the foregoing, Applicants respectfully request that the preceding rejection be withdrawn.

***Rejection under 35 U.S.C. § 112 ¶ 2***

Claims 5, 6, and 9 are rejected under 35 U.S.C. § 112, ¶ 2 as allegedly being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicants regard as the invention. (*Office Action, pages 4-5*). Solely in the interest of expediting prosecution, claims 5, 6, and 9 have been canceled. Based on the foregoing, Applicants respectfully request that the preceding rejection be withdrawn.

***Rejections under 35 U.S.C. § 102***

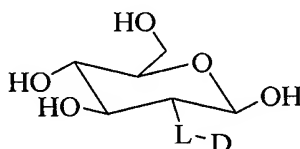
The Office issued three rejections under 35 U.S.C. § 102. First, claims 1, 2, 5 and 25 are rejected under 35 U.S.C. § 102(e) as allegedly being anticipated by Tidmarsh *et al.*, U.S. Pat. No. 6,989,140 ("Tidmarsh"). Applicants respectfully traverse this rejection. The Office is of the opinion that:

Tidmarsh *et al.* teach methods for detecting or imaging cancerous cells or tissue using a fluorophore glucose or deoxyglucose conjugate [column 5, lines 35-40]. One example of administration of the conjugate is by oral solution, pill or suppository [column 26, lines 2-5]. The fluorophore conjugate has the formula Fl-L-Glc wherein Fl is a fluorophore, L is a bond or linking group, and Glc is glucose, deoxyglucose or a derivative [column 5, lines 55-60]. . . . The conjugates taught by Tidmarsh *et al.* are photosensitive agents and tumor diagnostic agents because they fluoresce in response to light and are used to diagnose cancer. Thus, Tidmarsh *et al.* anticipates the limitations in these claims.  
(*Office Action, pages 5-6*)

Applicants respectfully disagree. Tidmarsh does not teach each and every element of the originally claimed invention. In order to anticipate and render pending claims unpatentable under § 102, the Tidmarsh reference must teach all elements of the claimed invention. *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631 (Fed. Cir.

1987) (holding "[a] claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference"). It appears that Tidmarsh does not teach the linker groups (L) or the diagnostic groups (D) of the claimed invention. Notwithstanding, solely to expedite prosecution, Applicants has amended claim 1 which now recites (*amendment format omitted*):

A 2-deoxyglucose conjugate, wherein said conjugate is represented by the formula:



or a pharmaceutically acceptable salt thereof, wherein L is a linker group; and D is selected from the group consisting of BChlPP (bacteriopurpurin-18), BChlE6 (bacteriochlorin e<sub>6</sub>) and NIR664 (tricarbo-cyanine).

Tidmarsh does not teach the linker groups (L) or the diagnostic groups (D) recited in claim 1.

Second, claim 1, 2 and 5 are rejected under 35 U.S.C. § 102(e) as allegedly being anticipated by Dufes, C. et al., *Pharmaceutical Research*, 17:1250-1258 (2000) ("Dufes"). Applicants respectfully traverse this rejection. The Office is of the opinion that:

Dufes et al. teach N-palmitoyl glucosamine [Figure 1]. Niosomes were prepared from this compound for use in drug targeting [see abstract]. (*internal figure omitted*). In this case, the therapeutic agent is palmitic acid and the linker group L is -NH-. Palmitic acid is used in skin lotions and as such is considered a dermitic. Thus, Dufes et al. anticipates the limitations in these claims.

(*Office Action, page 7*)

Applicants respectfully disagree. Dufes does not each and every element of the originally claimed invention and therefore does not anticipate the claimed invention.

Notably, Dufes teaches N-palmitoyl glucosamine as an intermediate in the synthesis of

niosomes, polymer-like molecules. Dufes at page 1251. Dufes also teach the use of such "polymeric" vesicles or niosomes as molecules for drug delivery. Dufes, at page 1250. The Office has not provided support for its assertion that palmitic acid is used in skin lotions, and is therefore considered a dermatic. Dufes does not teach using palmitic acid as a dermatic. Rather, the compound that the Office illustrates in Figure 1 (*Office Action*, page 7) is an intermediate. Thus, Dufes does not anticipate the claimed invention. Notwithstanding, solely to expedite prosecution, Applicants has amended claim 1 to recite specific "D" groups. Dufes does not teach these groups nor the linker groups (L) of the claimed invention.

Finally, claim 1, 2 and 5 are rejected under 35 U.S.C. § 102(e) as allegedly being anticipated by Daishu, Z. et al., *Journal of Chinese Pharmaceutical Sciences*, 10:193-195 (2001) ("Daishu"). Applicants respectfully traverse this rejection. The Office is of the opinion that:

Daishu et al. teach aminoglucose conjugates of 5-fluorouracil [page 193] . . . (*internal figure omitted*). In this case, 5-Fluorouracil-1-acetic acid and 5-Fluorouracil-1-propanoic acid are each therapeutic agents and the linker group L is -NH-. The compounds exhibit antitumour activities [page 195, Table 3]. Thus, Daishu et al. anticipates the limitations in these claims. (*Office Action*, pages 7-8)

Applicants respectfully disagree. Daishu does not each and every element of the originally claimed invention and therefore does not anticipate the claimed invention. Notwithstanding, in order to expedite prosecution, Applicants has amended claim 1 which falls outside the teachings of Daishu and is therefore not anticipated by Daishu. Based on the foregoing, Applicants respectfully request that the preceding rejections under 35 U.S.C. § 102(e) be withdrawn.

***Rejections under 35 U.S.C. § 103(a)***

The Office issued two rejections under 35 U.S.C. § 103(a). First, claims 1, 2, 5, 6, 9, 10 and 25 are rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Tidmarsh et al., U.S. Pat. No. 6,989,140 ("Tidmarsh") in view of Kozyrev et al., *Tetrahedron Letters*, 37:6431-6434 (1996) ("Kozyrev"). Applicants respectfully traverse this rejection. The Office is of the opinion that:

Tidmarsh et al. teach as set forth above. Tidmarsh et al. do not teach a glucose conjugate with BChlPP. Kozyrev et al. teach the conversion of unstable bacteriochlorophyll-a into stable bacteriochlorins [see abstract]. . . . It would have been obvious to one of ordinary skill in the art at the time the invention was made to prepare glucose conjugates with bacteriopurpurins, including those represented by 2 and 3 in the Kozyrev reference. The skilled artisan would have been motivated to do so because Tidmarsh et al. teach that glucose conjugates with fluorophores are useful for cancer detection and Kozyrev et al. teach that bacteriopurpurins 2 and 3 have ideal properties for photodynamic therapy.  
(*Office Action*, pages 9-10)

Applicants respectfully disagree. To establish a *prima facie* case of obviousness under Section 103(a), the Office must make the analysis supporting a rejection under 35 U.S.C. 103(a) explicit. Fed. Reg. Vol. 72, No. 196, 57526, 57529 "Examination Guidelines for Determining Obviousness Under 35 U.S.C. 103 in View of the Supreme Court Decision in *KSR International Co. v. Teleflex Inc.*", (October 10, 2007) ("Guidelines"). The Guidelines set forth several rationales to support rejections under 35 U.S.C. 103. Guidelines at 57528. The rationales listed are:

- (A) Combining prior art elements according to known methods to yield predictable results;
- (B) Simple substitution of one known element for another to obtain predictable results;
- (C) Use of known technique to improve similar devices (methods, or products) in the same way;
- (D) Applying a known technique to a known device (method, or product) ready for improvement to yield predictable results;

(E) "Obvious to try"--choosing from a finite number of identified, predictable solutions, with a reasonable expectation of success;

(F) Known work in one field of endeavor may prompt variations of it for use in either the same field or a different one based on design incentives or other market forces if the variations would have been predictable to one of ordinary skill in the art;

(G) Some teaching, suggestion, or motivation in the prior art that would have led one ordinary skill to modify the prior art reference or to combine prior art reference teachings to arrive at the claimed invention.

Guidelines at 57529.

The Office appears to base its rejection of claims 1, 2, 5, 6, 9, 10 and 25 on Rationale A which requires a finding that the prior art include each element claimed, although not necessarily in a single prior art reference, with the only difference between the claimed invention and the prior art being the lack of actual combination of the elements in a single prior art reference. Guidelines at 57529.

The currently amended claimed subject matter is not obvious in view of Tidmarsh and Kozyrev. Applicants agree that Tidmarsh does not teach a glucose conjugate with BChlPP. Applicants also agree that Kozyrev teaches the conversion of unstable bacteriochlorophyll-a into stable bacteriochlorins. Neither Tidmarsh nor Kozyrev teach or suggest the elements of the claimed invention. Furthermore, neither Tidmarsh nor Kozyrev teach the claimed D groups: BChlPP (bacteriopurpurin-18), BChlE6 (bacteriochlorin e<sub>6</sub>) and NIR664 (tricarbochrome).

Therefore, Office has not successfully maintained its burden of establishing a *prima facie* case of obviousness. First, the Office has not shown that Tidmarsh and Kozyrev, separately or together, teach all the claimed elements. Second, the Office has not shown that Tidmarsh and Kozyrev, separately or together, teach the combination of the claimed elements via known methods to yield predictable results. Accordingly, Applicants respectfully request that the preceding rejection be withdrawn.

Second, claim 25 is rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Dufes, C. et al., *Pharmaceutical Research*, 17:1250-1258 (2000) ("Dufes") in view of Daishu, Z. et al., *Journal of Chinese Pharmaceutical Sciences*, 10:193-195 (2001) ("Daishu"). Applicants respectfully traverse this rejection. The Office is of the opinion that:

Dufes et al. and Daishu et al. teach as set forth above. Dufes et al. and Daishu et al. do not teach a pharmaceutical composition comprising the respective glucose conjugates. It would have been obvious to one of ordinary skill in the art at the time the invention was made to prepare pharmaceutical compositions comprising aminoglucose conjugates of 5-Fluorouracil and N-palmitoyl glucosamine (NPG). The skilled artisan would have been motivated to do so with an expectation of success because 5-Fluorouracil is a cancer drug which must be administered as a pharmaceutical composition and NPG niosomes are useful for drug targeting, which also implies a pharmaceutical composition. . . . [T]he [Office] concludes that the subject matter defined by the instant claims would have been obvious within the meaning of 35 U.S.C. 103(a). From the teachings of the references, it is apparent that one of ordinary skill in the art would have had a reasonable expectation of success in producing the claimed invention. Therefore, the invention as a whole was *prima facie* obvious to one of ordinary skill in the art at the time the invention was made, as evidenced by the references, especially in the absence of evidence to the contrary.

Applicants respectfully disagree. The Office appears to base its rejection of claim 25 on Rationale A which requires a finding that the prior art include each element claimed, although not necessarily in a single prior art reference, with the only difference between the claimed invention and the prior art being the lack of actual combination of the elements in a single prior art reference. Guidelines at 57529.

The currently amended claimed subject matter is not obvious in view of Dufes and Daishu. Applicants agree that Dufes and Daishu do not teach pharmaceutical compositions comprising the respective glucose conjugates. In fact, Dufes teaches N-palmitoyl glucosamine as an intermediate in the synthesis "polymeric" vesicles or



nisomes, molecules for drug delivery. Dufes at page 1252. In addition, Daishu et al. teach aminoglucose conjugates of 5-fluorouracil. Daishu at page 193.

Neither Dufes nor Daishu teach or suggest the elements of the claimed invention. Furthermore, neither Dufes and Daishu teach the claimed D groups: BChlPP (bacteriopurpurin-18), BChlE6 (bacteriochlorin e<sub>6</sub>) and NIR664 (tricarboyanine). Therefore, Office has not successfully maintained its burden of establishing a *prima facie* case of obvious. First, the Office has not shown that Dufes and Daishu, separately or together, teach all the claimed elements. Second, the Office has not shown that Dufes and Daishu, separately or together, teach the combination of the claimed elements via known methods to yield predictable results. Accordingly, Applicants respectfully request that the preceding rejection be withdrawn.

#### ***Other Matters***

If claims 1-2, 5-6, 9-10 and 25 are found allowable, Applicants respectfully request that method claims 13-24 and 26-36 be rejoined with any allowed claims within the meaning of to MPEP § 821.04. MPEP § 821.04, 2100-195 (which states that "[i]n order to be eligible for rejoinder, a claim to a nonelected invention must depend from or otherwise require all the limitations of an allowable claim.")

#### ***Conclusion***

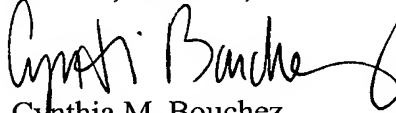
All of the stated grounds of objection and rejection have been properly traversed, accommodated, or rendered moot. Applicants therefore respectfully request that the Office reconsider all presently outstanding objections and rejections and that they be withdrawn. Applicants believe that a full and complete reply has been made to the outstanding Office Action and, as such, the present application is in condition for

allowance. If the Office believes, for any reason, that personal communication will expedite prosecution of this application, the Office is invited to telephone the undersigned at the number provided.

Prompt and favorable consideration of this Amendment and Reply is respectfully requested.

Respectfully submitted,

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Date: December 28, 2007

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